

# NASA TECH BRIEF

## *Marshall Space Flight Center*



NASA Tech Briefs announce new technology derived from the U.S. space program. They are issued to encourage commercial application. Tech Briefs are available on a subscription basis from the National Technical Information Service, Springfield, Virginia 22151. Requests for individual copies or questions relating to the Tech Brief program may be directed to the Technology Utilization Office, NASA, Code KT, Washington, D.C. 20546.

### Redundant Data Management System

A data management system designed for use in a major aerospace program to achieve high reliability in safety by using redundancy may be extended to commercial and industrial areas. The function of the system, as designed for this program, is to provide a data transmission and data processing service for the avionics equipment and associated vehicle subsystems. It performs all data processing on-board of the space vehicle with the exception of functions assigned to special processors for engine control and for analog stability augmentation.

The redundant data management system of this innovation solves the problem of operating redundant equipment in a real time environment where failures are detected, isolated, and switched in a simple manner. The problem in the past has been solved with complicated approaches which considered the amount of additional equipment with all possible failure modes to keep the redundant equipment operating in a failure tolerant environment. The advantage of the present concept is that the redundant data management system inherently contains the failure detection, isolation, and switching function.

The system consists of quadruply-redundant com-

puters, input/output control units, and data buses. Centralized by the system control unit and supported by quadruple-redundance, failures may be detected, isolated, and switched automatically.

#### Notes:

1. Information concerning this innovation may be of interest to the aircraft industry and high speed ground transit agencies.
2. Requests for further information may be directed to:  
Technology Utilization Officer  
Marshall Space Flight Center  
Code A&PS-TU  
Marshall Space Flight Center, Alabama 35812  
Reference: B72-10589

Source: J. R. Hall of  
McDonnell Douglas Corp.  
under contract to  
Marshall Space Flight Center  
(MFS-21831)

Category 09